

Part A: Executive Summary

The 2010 Dietary Guidelines Advisory Committee (DGAC) was established jointly by the Secretaries of US Department of Agriculture (USDA) and the US Department of Health and Human Services (HHS). The Committee's task was to advise the Secretaries of USDA and HHS on whether revisions to the 2005 Dietary Guidelines were warranted, and if so, to recommend updates to the Guidelines. The DGAC immediately recognized that, on the basis of the vast amount of published research and emerging science on numerous relevant topics, an updated report was indeed needed.

The 2010 DGAC Report is distinctly different from previous reports in several ways. First, it addresses an American public of whom the majority are overweight or obese and yet under-nourished in several key nutrients. Second, the Committee used a newly developed, state-of-the-art, web-based electronic system and methodology, known as the Nutrition Evidence Library (NEL), to answer the majority of the scientific questions it posed. The remaining questions were answered by data analyses, food pattern modeling analyses, and consideration of other evidence-based reviews or existing reports, including the 2008 *Physical Activity Guidelines for Americans*. The 2005 Dietary Guidelines for Americans were the starting place for most reviews. If little or no scientific literature had been published on a specific topic since the 2005 Report was presented, the DGAC indicated this and established the conclusions accordingly.

A third distinctive feature of this Report is the introduction of two newly developed chapters. The first of these chapters considers the total diet and how to integrate all of the Report's nutrient and energy recommendations into practical terms that encourage personal choice but result in an eating pattern that is nutrient dense and calorie balanced. The second chapter complements this total diet approach by integrating and translating the scientific conclusions reached at the individual level to encompass the broader environmental and societal aspects that are crucial to full adoption and successful implementation of these recommendations.

The remainder of this Executive Summary provides brief synopses of these and all of the other chapters, which reviewed current evidence related to specific topics and presents the resulting highlights that comprise the fundamental essence of this report.

Major Cross-cutting Findings and Recommendations

Total Diet: Combining Nutrients, Consuming Foods

The 2010 DGAC report concludes that good health and optimal functionality across the life span are achievable goals but require a lifestyle approach including a total diet that is energy

balanced and nutrient dense. Now, as in the past, a disconnect exists between dietary recommendations and what Americans actually consume. On average, Americans of all ages consume too few vegetables, fruits, high-fiber whole grains, low-fat milk and milk products, and seafood and they eat too much added sugars, solid fats, refined grains, and sodium. SoFAS (added sugars and solid fats) contribute approximately 35 percent of calories to the American diet. This is true for children, adolescents, adults, and older adults and for both males and females. Reducing the intake of SoFAS can lead to a badly needed reduction in energy intake and inclusion of more healthful foods into the total diet.

The diet recommended in this Report is not a rigid prescription. Rather, it is a flexible approach that incorporates a wide range of individual tastes and food preferences. Accumulating evidence documents that certain dietary patterns consumed around the world are associated with beneficial health outcomes. Patterns of eating that have been shown to be healthful include the Dietary Approaches to Stop Hypertension (DASH)-style dietary patterns and certain Mediterranean-style dietary patterns. Similarly, the USDA Food Patterns illustrate that both nutrient adequacy and moderation goals can be met in a variety of ways. The daunting public health challenge is to accomplish population-wide adoption of healthful dietary patterns within the context of powerful influences that currently promote unhealthy consumer choices, behaviors, and lifestyles.

Translating and Integrating the Evidence: A Call to Action

Complementing the Total Diet chapter, this chapter describes the four major findings that emerged from the DGAC's review of the scientific evidence and articulates steps that can be taken to help all Americans adopt health-promoting nutrition and physical activity guidelines:

- Reduce the incidence and prevalence of overweight and obesity of the US population by reducing overall calorie intake and increasing physical activity.
- Shift food intake patterns to a more plant-based diet that emphasizes vegetables, cooked dry beans and peas, fruits, whole grains, nuts, and seeds. In addition, increase the intake of seafood and fat-free and low-fat milk and milk products and consume only moderate amounts of lean meats, poultry, and eggs.
- Significantly reduce intake of foods containing added sugars and solid fats because these dietary components contribute excess calories and few, if any, nutrients. In addition, reduce sodium intake and lower intake of refined grains, especially refined grains that are coupled with added sugar, solid fat, and sodium.
- Meet the 2008 Physical Activity Guidelines for Americans.

The 2010 DGAC recognizes that substantial barriers make it difficult for Americans to accomplish these goals. Ensuring that all Americans consume a health-promoting dietary pattern and achieve and maintain energy balance requires far more than individual behavior change. A multi-sectoral strategy is imperative. For this reason, the 2010 DGAC strongly recommends that USDA and HHS convene appropriate committees, potentially through the Institute of Medicine (IOM), to develop strategic plans focusing on the actions needed to successfully implement key 2010 DGAC recommendations. Separate committees may be necessary because the actions needed to implement key recommendations likely differ by goal.

A coordinated strategic plan that includes all sectors of society, including individuals, families, educators, communities, physicians and allied health professionals, public health advocates, policy makers, scientists, and small and large businesses (e.g., farmers, agricultural producers, food scientists, food manufacturers, and food retailers of all kinds), should be engaged in the development and ultimate implementation of a plan to help all Americans eat well, be physically active, and maintain good health and function. It is important that any strategic plan is evidence-informed, action-oriented, and focused on changes in systems in these sectors.

Any and all systems-based strategies must include a focus on children. Primary prevention of obesity must begin in childhood. This is the single most powerful public health approach to combating and reversing America's obesity epidemic over the long term.

Strategies to help Americans change their dietary intake patterns and be physically active also will go a long way to ameliorating the disparities in health among racial and ethnic minorities and among different socioeconomic groups, which have been recognized as a significant concern for decades. While the reasons for these differences are complex and multifactorial, this Report addresses research indicating that certain dietary changes can provide a means to reduce health disparities.

Change is needed in the overall food environment to support the efforts of all Americans to meet the key recommendations of the 2010 DGAC. To meet these challenges, the following sustainable changes must occur:

- Improve nutrition literacy and cooking skills, including safe food handling skills, and empower and motivate the population, especially families with children, to prepare and consume healthy foods at home.
- Increase comprehensive health, nutrition, and physical education programs and curricula in US schools and preschools, including food preparation, food safety, cooking, and physical education classes and improved quality of recess.

- For all Americans, especially those with low income, create greater financial incentives to purchase, prepare, and consume vegetables and fruit, whole grains, seafood, fat-free and low-fat milk and milk products, lean meats, and other healthy foods.
- Improve the availability of affordable fresh produce through greater access to grocery stores, produce trucks, and farmers' markets.
- Increase environmentally sustainable production of vegetables, fruits, and fiber-rich whole grains.
- Ensure household food security through measures that provide access to adequate amounts of foods that are nutritious and safe to eat.
- Develop safe, effective, and sustainable practices to expand aquaculture and increase the availability of seafood to all segments of the population. Enhance access to publicly available, user-friendly benefit/risk information that helps consumers make informed seafood choices.
- Encourage restaurants and the food industry to offer health-promoting foods that are low in sodium; limited in added sugars, refined grains, and solid fats; and served in smaller portions.
- Implement the US National Physical Activity Plan, a private-public sector collaborative promoting local, state, and national programs and policies to increase physical activity and reduce sedentary activity (<http://www.physicalactivityplan.org/index.htm>). Through the Plan and other initiatives, develop efforts across all sectors of society, including health care and public health; education; business and industry; mass media; parks, recreation, fitness, and sports; transportation, land use and community design; and volunteer and non-profit. Reducing screen time, especially television, for all Americans also will be important.

Topic-specific Findings and Conclusions

Energy Balance and Weight Management

The prevalence of overweight and obesity in the US has increased dramatically in the past three decades. This is true of children, adolescents, and adults and it is more severe in minority groups. The American environment is conducive to this epidemic, presenting temptation to the populace in the form of tasty, energy-dense, micronutrient-poor foods and beverages. The macronutrient distribution of a person's diet is not the driving force behind the current obesity epidemic. Rather, it is the over-consumption of total calories coupled with very low physical activity and too much sedentary time. The energy density of foods eaten is an important factor in overeating. Americans eat too many calories from foods high in solid fats and added sugars (SoFAS) that offer few or no

other nutrients besides calories. This is true not only for adults but also for children, who consume energy-dense SoFAS, especially in the form of sugar-sweetened beverages, at levels substantially higher than required to maintain themselves at a normal weight as they grow.

With regard to special subgroups, maternal obesity before pregnancy and excessive weight gain during pregnancy are deleterious for the mother and the fetus. One-fifth of American women are obese when they become pregnant, often put on much more weight than is healthy during pregnancy, and have trouble losing it after delivery, placing their offspring at increased risk of obesity and type 2 diabetes (T2D) later in life. Breastfeeding has no sustained impact on maternal weight gain or loss, but has numerous benefits for mother and infant and should be encouraged.

Older overweight or obese adults can derive as much benefit from losing weight and keeping it off as do younger persons, with resulting improvements in quality of life, including diminished disabilities and lower risks of chronic diseases.

Selected behaviors that lead to a greater propensity to gain weight include too much TV watching, too little physical activity, eating out frequently (especially at Quick Service Restaurants [i.e. fast food restaurants]), snacking on energy-dense food and drinks, skipping breakfast, and consuming large portions. Self-monitoring, including knowing one's own calorie requirement and the calorie content of foods, helps make individuals conscious of what, when, and how much they eat. Mindful, or conscious, eating is an important lifestyle habit that can help to prevent inappropriate weight gain, enhance weight loss in those who should lose weight, and assist others in maintaining a healthy weight.

Nutrient Adequacy

Americans are encouraged to lower overall energy intakes to match their energy needs. Energy-dense forms of foods, especially foods high in SoFAS, should be replaced with nutrient-dense forms of vegetables, fruits, whole grains, and fluid milk and milk products to increase intakes of shortfall nutrients and nutrients of concern—vitamin D, calcium, potassium, and dietary fiber. Women of reproductive capacity should consume foods rich in folate and iron, and older individuals should consume fortified foods rich in vitamin B₁₂ or B₁₂ supplements, if needs cannot be met through whole foods. Nutritious breakfast consumption and in some cases nutrient-dense snacking may assist in meeting nutrient recommendations, especially in certain subgroups.

A daily multivitamin/mineral supplement does not offer health benefits to healthy Americans. Individual mineral/vitamin supplements can benefit some population groups with known deficiencies, such as calcium and vitamin D supplements to reduce risk of osteoporosis or iron

supplements among those with deficient iron intakes. However, in some settings, mineral/vitamin supplements have been associated with harmful effects and should be pursued cautiously.

Fatty Acids and Cholesterol

Intakes of dietary fatty acids and cholesterol are major determinants of cardiovascular disease (CVD) and T2D, two major causes of morbidity and mortality in Americans. Fats contribute 9 calories per gram. The health impacts of dietary fats and cholesterol are mediated through levels of serum lipids, lipoproteins, and other intermediate markers. The US consumption of harmful types and amounts of fatty acids and cholesterol has not changed appreciably since 1990.

In order to reduce the population's burden from CVD and T2D and their risk factors, the preponderance of the evidence indicates beneficial health effects are associated with several changes in consumption of dietary fats and cholesterol. These include limiting saturated fatty acid intake to less than 7 percent of total calories and substituting instead food sources of mono- or polyunsaturated fatty acids. As an interim step toward achieving this goal, individuals should first aim to consume less than 10 percent of energy as saturated fats and gradually reduce intake over time, while increasing polyunsaturated and monounsaturated sources. Other beneficial changes include limiting dietary cholesterol to less than 300 mg per day, but aiming at further reductions of dietary cholesterol to less than 200 mg per day in persons with or at high risk for CVD or T2D, and limiting cholesterol-raising fats (saturated fats exclusive of stearic acid and *trans* fatty acids) to less than 5 to 7 percent of energy.

Beneficial changes also include avoiding *trans* fatty acids from industrial sources in the American diet, leaving small amounts (<0.5% of calories) from *trans* fatty acids from natural (ruminant) sources, and consuming two servings of seafood per week (4 oz. cooked, edible seafood per serving) that provide an average of 250 mg/day of *n*-3 fatty acids from marine sources (i.e., docosahexaenoic acid [DHA] and eicosapentaenoic acid [EPA]). Ensuring maternal dietary intake of long chain *n*-3 fatty acids, in particular DHA, during pregnancy and lactation through two or more servings of seafood per week also has benefits for the infant, especially when women emphasize types of seafood high in *n*-3 fatty acids and with low methyl mercury content.

Protein

Proteins are unique because they provide both essential amino acids to build body proteins and are a calorie source. Protein contributes 4 calories per gram. Because protein requirements are based on ideal body weight (0.8 g protein/kg body weight/day for ages 19 years and older), lower-calorie diets result in a higher percentage of protein intake. Animal sources of protein, including meat, poultry, seafood, milk, and eggs, are the highest quality proteins. Plant proteins can be combined to

form complete proteins if combinations of legumes and grains are consumed. Plant-based diets are able to meet protein requirements for essential amino acids through planning and offer other potential benefits, such as sources of fiber and nutrients important in a health-promoting diet.

Carbohydrates

Carbohydrates contribute 4 calories per gram and are the primary energy source for active people. Sedentary people, including most Americans, should decrease consumption of energy-dense carbohydrates, especially refined, sugar-dense sources, to balance energy needs and attain and maintain ideal weight. Americans should choose fiber-rich carbohydrate foods such as whole grains, vegetables, fruits, and cooked dry beans and peas as staples in the diet. Low-fat and fat-free milk and milk products are also nutrient-dense sources of carbohydrates in the diet and provide high-quality protein, vitamins, and minerals. High-energy, non-nutrient-dense carbohydrate sources that should be reduced to aid in calorie control include sugar-sweetened beverages; desserts, including grain-based desserts; and grain products and other carbohydrate foods and drinks that are low in nutrients.

Sodium, Potassium, and Water

At present, Americans consume excessive amounts of sodium and insufficient amounts of potassium. The health consequences of excessive sodium and insufficient potassium are substantial and include increased levels of blood pressure and its consequences (heart disease and stroke). In 2005, the DGAC recommended a daily sodium intake of less than 2,300 mg for the general adult population and stated that hypertensive individuals, Blacks, and middle-aged and older adults would benefit from reducing their sodium intake even further to 1,500 mg per day. Because these latter groups together now comprise nearly 70 percent of US adults, the goal should be 1,500 mg per day for the general population. Given the current US marketplace and the resulting excessively high sodium intake, it will be challenging to achieve the lower level. In addition, time is required to adjust taste perception in the general population. Thus, the reduction from 2,300 mg to 1,500 mg per day should occur gradually over time. Because early stages of blood pressure-related atherosclerotic disease begin during childhood, both children and adults should reduce their sodium intake.

Individuals also should increase their consumption of dietary potassium because increased potassium intakes helps to attenuate the effects of sodium on blood pressure. Water is needed to sustain life. However, there is no evidence, except under unusual circumstances, that water intake among Americans is either excessive or insufficient.

Alcohol

An average daily intake of one to two alcoholic beverages is associated with the lowest all-cause mortality and a low risk of diabetes and coronary heart disease among middle-aged and older adults. Despite this overall benefit of moderate alcohol consumption, the DGAC recommends that if alcohol is consumed, it should be consumed in moderation, and only by adults. Moderate alcohol consumption is defined as average daily consumption of up to one drink per day for women and up to two drinks per day for men, with no more than three drinks in any single day for women and no more than four drinks in any single day for men. One drink is defined as 12 fl. oz. of regular beer, 5 fl. oz. of wine, or 1.5 fl. oz. of distilled spirits.

The DGAC found strong evidence that heavy consumption of four or more drinks a day for women and five or more drinks a day for men has harmful health effects. A number of situations and conditions call for the complete avoidance of alcoholic beverages.

Food Safety and Technology

Since the release of the 2005 Dietary Guidelines, food safety concerns have escalated, with the apparent increase in voluntary recalls of foods contaminated with disease-causing bacteria and adulterated with non-food substances. These food safety issues affect commercial food products and food preparations in the home.

The basic four food safety principles identified to reduce the risk of foodborne illnesses remain unchanged. These principles are Clean, Separate, Cook, and Chill. Consumers must take more responsibility for carrying out these essential food safety practices. These actions, in tandem with sound government policies and responsible food industry practices, can help prevent foodborne illness. Even with current and future introductions of food safety technologies, food safety fundamentals in the home remain foundational.

The health benefits from consuming a variety of cooked seafood outweigh the risks associated with exposure to methyl mercury and persistent organic pollutants, provided that the types and sources of seafood to be avoided by some consumers are clearly communicated to consumers. Overall, consumers can safely eat at least 12 oz. of a variety of cooked seafood per week provided they pay attention to local seafood advisories and limit their intake of large, predatory fish. Women who may become or who are pregnant, nursing mothers, and children ages 12 and younger can safely consume a variety of cooked seafood in amounts recommended by this Committee while following Federal and local advisories.

Conclusion

The 2010 DGAC recognizes the significant challenges involved in implementing the goals outlined in this Report. The challenges go beyond cost, economic interests, technological and societal changes, and agricultural limitations, but together, stakeholders and the public can make a difference. We must value preparing and enjoying healthy food and the practices of good nutrition, physical activity, and a healthy lifestyle. The DGAC encourages all stakeholders to take actions to make every choice available to Americans a healthy choice. To move toward this vision, all segments of society—from parents to policy makers and everyone else in between—must now take responsibility and play a leadership role in creating gradual and steady change to help current and future generations live healthy and productive lives. A measure of success will be evidence that meaningful change has occurred when the 2015 DGAC convenes.